CLAIMS

1. A microporous material which comprises a positively charged framework.

2. A microporous material as claimed in claim 1 which comprises a silicophosphate structure.

3. A microporous material as claimed in claim 1 or 2 having a framework density in the range of 12.5 to 20.5.

4. The use of a microporous material which comprises a positively charged framework as an anion exchange material.

5. The use as claimed in claim 4 which comprises the treatment of waste materials in effluent streams.

6. The use as claimed in claim 5 which comprises the removal of undesirable anion species from solutions in the nuclear power industry.

7. The use as claimed in claim 6 wherein the anion species comprises pertechnetate anions.

8. A microporous material for use as an anion exchange resin.

9. A silicophosphate for use as an anion exchange material.

10. An anion exchange material which comprises a microporous material.

11. An anion exchange material which comprises a silicophosphate.

12. A method for the synthesis of a microporous material which comprises a positively charged framework, wherein said microporous material comprises a silicophosphate, said method comprising:

(a) providing a two-phase system comprising:

(i) an organic phase comprising an organosilicon compound;

(ii) an aqueous phase comprising a phosphoric acid;

(iii) a phase transfer agent;

(iv) a structure directing agent; and

(v) a buffering agent;

(b) stirring and facilitating reaction between the reactants; and

(c) isolating the product.

13. A method as claimed in claim 12 wherein said organic phase comprises an alcoholic phase.

14. A method as claimed in claim 13 wherein said alcoholic phase comprises t-butanol or isoamyl alcohol.

15. A method as claimed in any one of claims 12, 13 or 14 wherein said organosilicon compound contains a labile group capable of reaction with phosphoric acid.

16. A method as claimed in claim 15 wherein said organosilicon compound comprises a tetramethylsilyl halide.

17. A method as claimed in claim 16 wherein said tetramethylsilyl halide comprises tetramethylsilyl chloride or tetramethylsilyl bromide.

18. A method as claimed in any one of claims 12 to 17 wherein said phosphoric acid comprises metaphosphoric acid or polyphosphoric acid.

19. A method as claimed in any one of claims 12 to 18 wherein said phase transfer agent comprises an organic sulphonate salt.

20. A method as claimed in claim 19 wherein said organic sulphonate salt comprises a toluene-4-sulphonate salt.

21. A method as claimed in claim 20 wherein said toluene-4-sulphonate salt comprises sodium toluene-4-sulphonate.

22. A method as claimed in any one of claims 12 to 21 wherein said structure directing agent comprises cations.

23. A method as claimed in claim 22 wherein said cations comprise tetraalkyl ammonium cations.

24. A method as claimed in claim 22 or 23 wherein said structure directing agent comprises tetraethyl ammonium chloride or tetraethyl ammonium bromide.

25. A method as claimed in any one of claims 12 to 24 wherein said buffering agent comprises an ammonium salt.

26. A method as claimed in claim 25 wherein said ammonium salt comprises ammonium acetate.

27. A method as claimed in any one of claims 12 to 26 which proceeds at a temperature of between 0° and 100°C.

28. A method as claimed in claim 27 which proceeds at a temperature of between 20° and 70°C.

29. A method as claimed in claim 28 which proceeds at a temperature of between 40° and 60°C.

30. A method as claimed in any one of claims 12 to 29 which proceeds for a duration of between 30 minutes and 12 hours.

31. A method as claimed in claim 30 which proceeds for a duration of between 2 and 10 hours.

32. A method as claimed in claim 31 which proceeds for a duration of between 6 and 8 hours.

33. A method as claimed in any one of claims 12 to 32 wherein the microporous material is isolated from the reaction mixture by filtration.